

Attorney Docket No.: 0120104C

**REMARKS**

Prior to the present response, claims 18-25 and 27-37 were pending in the present application. Claims 18-25 and 27-37 remain in the present application. Reconsideration and allowance of pending claims 18-25 and 27-37 in view of the following remarks are requested.

**A. Rejection of Claims 18-22, 24, 25, 27-30, and 32-37 under 35 USC §102(b)**

The Examiner has rejected claims 18-22, 24, 25, 27-30, and 32-37 under 35 USC §102(b) as being anticipated by U.S. patent number 5,734,703 to Yuichiro Hiyoshi ("Hiyoshi"). For the reasons discussed below, Applicants respectfully submit that the present invention, as defined by independent claims 18, 25, and 33, is patentably distinguishable over Hiyoshi.

The present invention, as defined by independent claim 18, includes, among other things, an interface circuit including a voltage-controlled current source including an operational amplifier configured to drive a base of an electronic inductor transistor capable of being connected across a rectified tip and ring voltage of a telephone line, where the interface circuit is configured to linearly vary a line current of the telephone line. As disclosed in the present application, according to various embodiments of the invention, an operational amplifier drives the base of an electronic inductor transistor and receives negative feedback from the emitter of the electronic inductor transistor. As

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disclosed in the present application, the transistor and operational amplifier combine to form a voltage-controlled current source (VCCS) with respect to loop current.

As disclosed in the present application, the operational amplifier linearizes the voltage signal at the emitter of the electronic inductor transistor (through the negative feedback input), and causes the line current to swing linearly. By setting the collector voltage well above the emitter voltage of the electronic inductor transistor, the present invention provides a harmonic content or distortion of the transmitted signal that is at least 80 dB below the fundamental signal level. As a result, the present invention advantageously achieves an acceptable level of distortion for high-speed modem applications.

In contrast, Hiyoshi does not teach, disclose, or suggest an interface circuit including a voltage-controlled current source including an operational amplifier configured to drive a base of an electronic inductor transistor capable of being connected across a rectified tip and ring voltage of a telephone line, where the interface circuit is configured to linearly vary a line current of the telephone line. Hiyoshi relates to a hybrid circuit for carrying out a four-wire to two-wire conversion of a channel, and to a data communication unit such as a MODEM for incorporating the hybrid circuit. See, for example, Hiyoshi, column 1, lines 12-15. Hiyoshi specifically discloses a circuit arrangement including circuit driver (an output driver) 520, which is connected across diode bridge 103, and semiconductor inductor circuit 540, which is also connected across diode bridge 103. See, for example, column 18, lines 3-5 and Figure 9 of Hiyoshi. In

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Hiyoshi, diode bridge 103 is coupled to a two-wire circuit. See, for example, Figure 9 of Hiyoshi.

In Hiyoshi, circuit driver 520 includes an amplifier that drives a base of a transistor, where the emitter of the transistor is coupled to an inverting input of the amplifier. See, for example, Figure 9 of Hiyoshi. On page 7 of the Final Rejection dated March 7, 2005, the Examiner states that “[t]he modem output driver disclosed in Hiyoshi (Fig. 9, reference 520; column 18, lines 3-4) has a feedback path from the transistor emitter to the inverting input of the amplifier and is therefore inherently configured to linearly vary a line current of the telephone line.” Applicant respectfully disagrees, since the circuit arrangement disclosed in Hiyoshi is significantly different than the interface circuit as specified in independent claim 18. In particular, Hiyoshi discloses two circuits (i.e. circuit driver 520 and semiconductor inductor circuit 540) that are connected across diode bridge 103, where each of the circuits (i.e. circuit driver 520 and semiconductor inductor circuit 540) includes an amplifier and a transistor, where the transistor is driven by the amplifier. Thus, in Hiyoshi, the combination of circuit driver 520 and semiconductor inductor circuit 540 will have some undisclosed effect on the line current of the two-wire circuit.

However, Hiyoshi fails to teach, disclose, or suggest an interface circuit including a voltage-controlled current source including an operational amplifier configured to drive a base of an electronic inductor transistor capable of being connected across a rectified tip and ring voltage of a telephone line, where the interface circuit is configured to linearly

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vary a line current of the telephone line. In fact, Hiyoshi fails to teach, disclose, or suggest an interface circuit that is configured to linearly vary a line current of a telephone line.

For the foregoing reasons, Applicant respectfully submits that the present invention as defined by independent claim 18 is not taught, disclosed, or suggested by Hiyoshi. Thus, independent claim 18 is patentably distinguishable over Hiyoshi. As such, claims 19-22 and 24 depending from independent claim 18 are, *a fortiori*, also patentably distinguishable over Hiyoshi for at least the reasons presented above and also for additional limitations contained in each dependent claim.

Also, independent claims 25 and 33 include similar limitations as independent claim 18 discussed above. Thus, for the reasons discussed above, Applicant respectfully submits that the present invention, as defined by independent claims 25 and 33, is not suggested, disclosed, or taught by Hiyoshi. Thus claims 27-30 and 32 depending from independent claim 25 and claims 34-37 depending from independent claim 33 are, *a fortiori*, also patentably distinguishable over Hiyoshi for at least the reasons presented above and also for additional limitations contained in each dependent claim.

**B. Rejection of Claims 23 and 31 under 35 USC §103(a)**

The Examiner has rejected claims 23 and 31 under 35 USC §103(a) as being unpatentable over Hiyoshi in view of U.S. patent number 4,796,295 to Gay et al. As discussed above, independent claims 18 and 25 are patentably distinguishable over

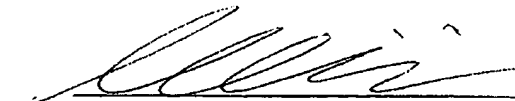
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Hiyoshi. Thus claim 23 depending from independent claim 18 and claim 31 depending from independent claim 25 are, *a fortiori*, also patentably distinguishable over Hiyoshi for at least the reasons presented above and also for additional limitations contained in each dependent claim.

**C. Conclusion**

Based on the foregoing reasons, the present invention, as defined by independent claims 18, 25, and 33, and the claims depending therefrom, is patentably distinguishable over the art cited by the Examiner. Thus, outstanding claims 18-25 and 27-37 are patentably distinguishable over the art cited by the Examiner. As such, and for all the foregoing reasons, an early Notice of Allowance directed to all claims 18-25 and 27-37 remaining in the present application is respectfully requested.

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